

HOUSEHOLD AND NATIONAL FOOD SECURITY IN SOUTHERN AFRICA



Edited by

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University of Zimbabwe UZ/MSU Food Research in Southern Africa

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FOREWORD

In 1985 the University of Zimbabwe and Michigan State University initiated a Food Security Research Network for Southern Africa. The objectives of the network are to conduct research that informs policymakers about food security issues and to help strengthen the regional capacity for food policy analysis. The underlying premise of the network is that building excellence in research capacity for national policy analysis comes through experience. In practice, this requires a long-term commitment to analytical capacity building, consistency in funding, and constant interaction between researchers and policymakers.

The network has sponsored four annual conferences for network researchers, policymakers, SADCC officials, and representative of international and donor agencies. The aim of the conference is to share research findings, identify new research themes, and provide an opportunity for policy dialogue between regional researchers, policymakers, and government officials.

The 1988 conference brought together 110 participants who deliberated on 28 papers. In the Official Opening, Vice-Chancellor W.J. Kamba of the University of Zimbabwe highlighted the importance of including health related-issues as a component of food security; and Zimbabwe's Senior Minister of Finance, Economic Planning, and Development B.T.G. Chidzero outlined policy reform priorities for Southern Africa. Subsequent sessions focused on *SADCC's Food Security Programme, the Impact of Market Reform on Food Security, Food Security Policy Options, New Technology to Improve Food Security, Family Food Security Options in Low-Rainfall Areas, Expanding Agricultural Trade in the SADCC Region, Nutrition and Food Security, the Contribution of Small-Scale Rural Enterprises to Employment Generation and Food Security, and the Impact of Irrigation on Food Security.*

A highlight of the 1988 conference was the participation of five nutritionists from Zambia, Zimbabwe, Sweden, and the United States. The presence of the nutritionists stimulated formal and informal discussions on the food access side of the food security equation and drew attention to the need to initiate more research in this area.

A second highlight of the 1988 conference was the attention given to reducing barriers to expanded intraregional trade in the SADCC region. Results presented suggest that there appear to be substantial price and nonprice barriers to expanded trade. Nevertheless, there exist significant opportunities for expanding intraregional trade that can be realized through appropriate government initiatives.

This proceeding contains revised papers prepared under the sponsorship of the University of Zimbabwe/Michigan State University Food Security Research Project in Southern Africa and presented at the University of Zimbabwe's Fourth Annual Conference on Food Security Research in Southern Africa, held at the Holiday Inn, Harare, October 31-November 3, 1988.

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EXCHANGE RATE OVERVALUATION AND AGRICULTURAL PERFORMANCE IN ZIMBABWE: 1965-1985

Kuphukile Mlambo¹

INTRODUCTION

In the 1960s and early 1970s, most African countries followed relatively passive exchange rate policies. This was the period when the Bretton Wood System was still in force, and the relative price (exchange rate) stability prevailed in both developed and developing countries. However, in 1972 the Bretton Wood System broke down and a number of developed countries adopted floating exchange rate systems. Most African countries opted not to float their currencies, but instead preferred to peg their currencies to a single currency (e.g., the US dollar) or to a basket of currencies.

With the benefit of hindsight, this appears to have been a mistake, because confronted with the oil crisis, increased inflation, and falling terms of trade, for many countries the exchange rate became overvalued. Prices were slowly getting out of line and export competitiveness was being lost. In the 1970s, no one was alarmed because any disequilibrium in balance of payments was covered by capital inflows from abroad.

In the 1980s all this changed. First, the debt crisis exploded; then capital inflows declined to a trickle; while export earnings continued to decline as developed countries became more protectionist and, in general, the capitalist world experienced a deep-seated recession. At the same time, the disequilibrium in the exchange rate became unsustainable, foreign exchange shortage became a fact of life, and in some countries a parallel market for foreign exchange developed. Clearly something had to be done, and there appears to have been a rush towards a much more active use of the exchange rate. This rush has been of three types:

- o Some countries, such as Malawi, have retained a fixed exchange regime, but also uses discrete devaluations to reduce overvaluation.
- o Some countries, such as Tanzania, have retained a fixed exchange rate system, but also moved to a crawling peg.
- o Some countries, like Zambia and Uganda, opted for a market-determined exchange rate system (e.g., foreign exchange auctions).

These exchange rate adjustments policies are designed to achieve three things:

- o to correct balance of payments disequilibrium (more specifically to deal with the current account deficits);
- o to restore international export competitiveness caused by decades of currency overvaluation; and
- o to switch expenditure away from the tradeable goods sector.

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However, after more than half a decade of exchange rate adjustment, it is still unclear whether these policies have achieved what they were intended to do. At the same time, the discussion has shifted away from the macro level, to study the impact of exchange rate adjustment (or failure to adjust) on inter- and intra-sectoral performance and resource allocation. The International Food Policy Research Institute (IFPRI) has carried out several studies to investigate the effects of exchange rate policies on agriculture. Valdes and Pinckney (1986) argued that the exchange rate is the most influential price affecting incentives for agriculture. This argument was endorsed by the World Bank in 1981 when it declared that trade and exchange rate policies were at the heart of the failure of most African countries to provide adequate incentives for agricultural production and for exports.

The relationship between exchange rate policy and agricultural production is easy to comprehend. Exchange rate adjustment is designed to change the domestic relative prices of tradeables and nontradeables to increase the profitability of producing tradeables. Since the largest contributor to the tradeable goods sectors is agriculture in most developing countries, a policy that affects the profitability of tradeable goods production similarly affects the profitability of agricultural activities.

In the last half of the 1980s, another dimension was added to the debate, the so-called cash crops debate (Maxwell, 1988). It was argued that while exchange rate adjustment may have favoured agricultural export production, it may have dire consequences for food security. If the connection between exchange rate policy and agricultural production is not easy to see, the connection between exchange rate and food security is even more clouded.

In this study, food security is considered as having two aspects: the basic cause (or aspect) of food security; and the secondary aspect (Eicher and Rukuni, 1986). The basic cause of food security is related to an income problem--people are food insecure because of reduced access to an adequate diet of food at all times. The secondary aspect of food security is related to food availability--people suffer from food insecurity because a country is unable to provide its citizens with an adequate diet from domestic production or is unable to increase food imports to meet its food consumption needs.

Exchange rate policy will impact on both aspects of food security. A policy that maintains an overvalued exchange rate would reduce the incentive to produce food crops (as food imports come in) and this will lead to a reduction in the returns to farmers. Since the majority of the farmers in developing countries are peasants who are net consumers, as opposed to net producers, an overvalued exchange rate would worsen their food security situation. It would appear that policies that turn the terms of trade against agriculture are detrimental to food security, since they worsen income and kill incentives to produce. Above all, for most developing countries, poor agricultural performance means poor overall economic growth rates. And unless a country is growing, it cannot guarantee an improvement in incomes, and therefore food security.

AGRICULTURE IN CONTEXT

In analyzing the impact of policy on agriculture in Zimbabwe, bear in mind that agriculture forms the backbone of the economy. Available data shows that in times of agricultural buoyancy, the economy is also buoyant, and vice versa. The years 1980 and 1981 were good agricultural seasons and real gross domestic product (GDP) grew at 11% and 10.7%, respectively. After these two good years, a three-year drought followed, during which GDP actually declined, falling as low as -4% in 1983.

- Despite its importance in the economy, agriculture's performance has been unimpressive. Despite remaining the second larger contributor to GDP, its share has been declining (Table 1). Between 1970-74, agriculture's share of GDP was 16.8%, but by 1982-83, it declined to 12.1%. In contrast, manufacturing increased its share from 22.7% in 1970-74 to over 25% in 1982-83. The table also shows that since the 1970-74 period, agricultural employment has been growing at a negative rate, while the agricultural share of total wage employment has been declining. Valdes and Pickney (1986) hypothesized that such a shift of labour from agriculture is "one of the most dramatic manifestations of the strong bias against agriculture resulting from trade and exchange policies". While this statement may appear a generalization and other factors exist to explain this phenomenon, it is possible to argue that during the *Unilateral Declaration of Independence* (1965-79), the development strategy tended to favour the manufacturing sector; and thus, encouraged resources to flow to this sector. Table 1 shows that this may have been the case, since the share of wage

Table 1. Selected sectoral indicators, Zimbabwe, 1965 to 1984 (percent).

Indicator	1965-69	1970-74	1975-79	1980-84	1980-81	1982-83
Increase in ag. employment ^a	0.2	4.1	2.1	4.5	8.4	0.8
Ag. employment share of total employment ^a	37.5	35.3	34.4	27.3	30.4	24.9
Mfg. employment share of total employment ^a	11.6	13.8	14.6	16.5	16.3	17.1
Ag. exports share of total exports ^b	na	na	21.8 ^c	28.5	26.8	30.7
Food exports share of ag. exports	na	na	76.5 ^d	45.0	32.9	43.7
Ag. output as share of GDP ^a	na	16.8	15.9	13.1	14.9	12.1

Source: ^aCalculated from Zimbabwe (various issues). ^bCalculated from Zimbabwe (1986). ^cOnly the years 1977-79 are included. ^dOnly the years 1978-79 are included. na = data not available.

employment in manufacturing to total wage employment increased over the same period.

However, to argue that industry has been protected at the expense of agriculture may be an over simplification, since from the 1930s, the state has canvassed policies designed to protect commercial agriculture. For example, in 1931 the Maize Control Board was set up to guarantee white settler farmers high domestic producer prices, high enough to compensate them for low export prices. At independence the government increased the producer price of maize by 41% and improved the access of peasant farmers to institutional credit in a bid to improve their productivity.

In the case of agricultural exports, total agricultural exports as a share of total exports have been increasing since the 1970s, while food exports have been falling (Table 1). These trends explain why, for Zimbabwe food self-sufficiency (as opposed to food security) is not yet an issue, although agricultural production, between 1965-80, grew at about 2% per annum, compared to an annual population growth rate of 3.5% (Green, 1986). A possible food supply crisis appears to have been avoided by a shift in the balance of food/export production. Government has maintained this policy after 1980, where maize exports are only permitted after domestic food requirements have been satisfied. Zimbabwe's major food exports are maize and beef.

Food imports do not constitute a significant proportion of the total import bill. In fact, in some official statistics food imports do not even appear, giving the impression that the gap between domestic food production and food demand is narrower. However, over the years, food imports have been increasing. For maize and other food crops, this is due to weather variability. For example in 1984, it was necessary to import 269,000 mt of maize following a three-year drought.

Food self-sufficiency is still not yet a problem for Zimbabwe, or as Green (1986) puts it, "the food constraint has been somewhat relaxed, or at least postponed, in itself a notable achievement and one demonstrating that political economic priority shifts towards egalitarianism can have distinct positive results" (p.19). However, this does not mean that food security at a national, or even regional level (since for SADCC, Zimbabwe was chosen to coordinate food security) is not going to be a problem. In fact, one observes here a paradox. Here we have a nation that, in good agricultural season, produces surplus food, and as a result maintains a huge and expensive food (grain) stock. Yet, its neighbours are importing food. Such a paradox can only be tackled at a policy and political level, and it appears that exchange rate adjustment could be one such policy.

POLICY ENVIRONMENT 1965-1985

UDI: 1965-1979

After Rhodesia unilaterally declared its independence from Britain in 1965, the United Nations, at the instigation of Britain, imposed trade sanctions, and a shortfall in foreign exchange emerged. In a bid to maintain production, the regime in power instituted an import substitution industrialization strategy, a strategy that requires protectionist policies to succeed. As a result, the UDI period witnessed the

development of a tightly controlled economic system with administrative allocations of foreign currency, price controls, and investment regulations. According to Mabhena (1988), these three instruments formed the main pillars of economic policy during UDI.

Foreign exchange allocation

The system for allocating foreign currency was (and has remained) central to the management of the economy. The actual allocation is largely based on the machinery designed in 1965. As a result, some observers argue that the procedures tended to favour those industries in operation at the time. However, the system did more than just maintain equilibrium in the external accounts or conserve scarce foreign currency--it actually provided sufficient protection for domestic industrial producers. As a result, both the exchange rate and custom duties (trade policy) did not play an important role.

Price controls

Price controls were instituted to keep the basic consumables within reach of the people. This was especially so in the case of basic food stuffs like mealie-meal and bread. For example, the selling price of maize remained Z\$4.17/mt between 1965 and 1974, while the producer price of Grade A maize increased from Z\$34.00 to Z\$36.37/mt over the same period. There was therefore a deliberate policy to keep the basic prices of basic food stuffs at affordable levels, while setting producer prices high enough to guarantee food availability.

Investment policy

The investment control policy was also limited to the foreign exchange allocation system in that investment control was instituted to save scarce foreign currency. These controls required that all new investment should save or earn (net) foreign exchange, thus providing further protection to domestic firms. Clearly then, UDI provides an example of instances where controls can work very well.

Assessment of the strategy

The strategy appears to have been successful during the early years of UDI (*i.e.*, up to 1974). Between 1965 to 1974, GDP grew at an annual average rate of above 7% and employment grew at above 3% per annum, while the rate of growth of gross fixed capital formation was 22%. Table 2 shows that Rhodesia managed to maintain a positive balance of trade, and this positive balance increased as a proportion of total exports. At the inception of UDI, imports as a share of national income stood at 45%. By the end of UDI (1980), imports had fallen to 36% of national income. In 1965, imports had fallen to 36% of national income. In 1965, exports were 55% of national income. However, they fell to 37% the following year, and by the end of UDI they were down to 32% of national income. Adding together the ratios of exports and imports to national income provides a basic measure of the degree of openness of the economy (Robinson, 1987). As shown on Table 3, at UDI Rhodesia's indicator of openness was 102%. In the following year it fell to 71%, and

Table 2. Indicators of international trade, Zimbabwe, 1970 to 1985.

	Exports	Imports	Balance of trade	Balance on current a/c	Balance of trade as % of exports	Current account as % of exports
	Million Zimbabwe dollars					
1970	258.7	235.0	23.8	na	9.2	na
1971	290.2	282.5	7.8	na	2.7	na
1972	349.1	274.7	74.4	na	21.3	na
1973	389.1	308.6	80.5	2.6	20.7	na
1974	531.2	438.3	92.8	95.5	17.5	na
1975	531.3	461.9	69.4	106.7	13.1	20.0
1976	557.4	382.7	174.7	9.9	31.3	1.8
1977	550.8	388.1	162.7	19.7	29.5	3.6
1978	609.3	403.7	205.6	13.4	33.7	7.2
1979	715.7	549.3	166.4	73.9	23.2	10.3
1980	909.2	809.4	99.8	156.7	11.0	17.2
1981	971.7	1,017.7	46.0	43.6	4.7	4.5
1982	968.4	1,081.8	113.4	532.9	11.7	55.0
1983	1,150.2	1,061.6	88.6	454.2	7.7	39.5
1984	1,453.0	1,200.7	252.3	101.9	17.4	7.0
1985	1,795.5	1,446.5	349.0	159.2	19.4	8.7

na = data not available

Source: Compiled from CSO (various issues).

Table 3. Exports and imports as a proportion of national income, Zimbabwe, 1965 to 1984.

Year	Exports	Imports	Exports + Imports
1965	55	47	102
1966	37	34	71
1975	31	32	63
1980	32	36	68
1981	28	36	64
1982	25	31	56
1983	26	30	56
1984	30	30	60

Source: Robinson (1987).

by 1980 this indicator was down to 68%, reflecting the development of a tightly-controlled economic policy environment.

However, after 1974 things started going wrong, as shown by Kadhani and Green (1985) and Green's (1986) analysis of the current account deficit (CAD) during this period. After 1974, several factors--like oil price increases, the international recession, the intensification of the liberation war, the effect of economic sanctions, the overheating of the domestic economy, and a highly import intensive expansion of gross fixed capital formation--rendered the CAD unsustainable. According to Green, the "domestic response was in a sense, an ultra orthodox demand-cutting strategy, albeit centered on achieving a visible trade surplus and balance on current account, rather than on domestic demand management per se, and on eschewing use of active interest on exchange rate policies" (p.21).

Thus, even when the development strategy began to run into a crisis, there was little change in the policy stance of the regime. By the end of UDI, there were signs that urgent change was necessary.

Post-independence: continuity in change

The post-independence government has effectively left intact the system of economic controls, but with some modification. In the immediate post-independence period, the government canvassed a strategy that promoted growth with equity. Growth was to be promoted by a dramatic increase in foreign exchange allocation. In the first two years of independence, this appears to have been achieved, as the economy experienced an impressive growth rate of 14%. In agriculture, the government also increased producer prices as follows: maize (40%); wheat (17%); soyabeans (5%); sorghum (31%), and groundnuts (8%). The government also incorporated the peasant sector into the cash economy by making subsidized credit available to them. Equity was to be achieved by expanding such social services as health and education, implementing the resettlement programme, and increasing minimum wages.

Approaching crisis

Towards the end of 1981, the strategy ran into a crisis, due to increased external imbalances, the drought, the international recession, and increased domestic inflation. To deal with these problems, the government introduced a radical programme of external adjustment, including foreign exchange allocation. However, this instrument was complemented by a devaluation of the Zimbabwe dollar and movement to a more flexible, albeit, managed exchange rate policy. At the same time, the government allowed the prices of basic food stuffs and other basic utilities to increase. The selling price of maize rose from Z\$89 to Z\$137/mt in 1982, while that of wheat rose from Z\$109.85/mt in 1982 to Z\$139.00/mt in 1983. Wage control was also introduced as an anti-inflation device.

There was, however, the paradox that, in spite of these "radical" policy measures, there was little control on the government budget deficit. While the current account deficit, as a proportion of GDP fell from 12.3% in 1981 to 4.1% in 1985, the budget deficit, as a share of GDP, increased from 9.4% to 18.3% over the same period.

The increase in the budget was due to increases in subsidies paid to parastatals and expenditures on defence, education, and health.

First five-year development plan

In 1986, the government published the country's *First Five Year National Development Plan* (1986-90) which contained government's policy intentions for the coming five years. The government planned to increase investment in the productive spheres of the economy (agriculture, manufacturing, and mining). Second, the government committed itself to reducing the budget deficit, and third, it adopted a policy of export promotion.

At the same time, the government has committed itself to gradual trade liberalization. To achieve this, the government has instituted a trade liberalization study which is expected to spell out the pace and areas of trade liberalization. This trade liberalization study is expected to form an input into an overall adjustment programme intended to achieve sustained growth in the Zimbabwean economy.

THE REAL EXCHANGE RATE (1965-1985)

It has been stated above that the policy environment during UDI became essentially interventionist and restrictionist, and any adjustment in the external account was achieved through administrative allocation of foreign currency. This section, analyses the impact of such a policy environment on the international competitiveness of the country's goods and incentives to produce tradeables.

Categories of exchange rates

According to Valdes and Pinckeney (1986), there are two categories of exchange rates: the nominal exchange rate (NER) and the real exchange rate (RER). They define the NER as an undeflated conversion factor between one currency and another; and the RER as a measure of the terms of trade between the traded and the nontraded goods in the economy. In this study, we have adopted the World Bank approach to exchange rate calculations. The World Bank calculates the exchange rate as "an index of relative domestic and world prices expressed in terms of a common currency (World Bank, 1987, p.101). In other words:

$$R = \frac{(P_q) (E_o)}{P_f}$$

Where:

R	=	Real exchange rate
E _o	=	Nominal exchange rate
P _q	=	Index of the price of home goods
P _f	=	Index of foreign prices.

As the World Bank mentions, defining R this way has certain advantages, in that if R is increasing, then clearly, the home currency is appreciating, and vice versa.

However, defining the real exchange rate this way raises two problems--one of measurement and the other of meaning. The measurement problem comes in when one wants to talk about the price index of home goods. Others have suggested that the price of home goods can be proxied by the GDP deflator, while others prefer to use the wage rate index. The use of the GDP deflator is problematic in the sense that tradeables are included in the index. Using the wage rate as the deflator "automatically makes the real exchange rate connote a real wage rate index" (Durnbush and Helmers, 1988, p.11). Besides, these problems of defining the appropriate price index for nontradeables, there are also "weighing problems in constructing an index of foreign prices" (World Bank, 1987, p.101). In this study, foreign prices were defined as the average of index prices of exports and imports in foreign currency, while four variables were used to proxy the price index of home goods. These were the building material price index; the food stuffs component in the consumer price index; and the average consumer price index for higher and lower income urban families.

The second problem with the way the real exchange rate is defined, is just what are we trying to show by the index. This is because as an index, the real exchange rate says nothing about whether the currency is over or undervalued. It only tells us how the exchange rate is fluctuating around a certain base period. Thus, what we are assuming is that a particular rate in the past was the correct one, *celeris paribus*; and therefore, it becomes a basis for a target.

Trends in the real exchange rate

In this study, 1980 has been chosen as the basic period. It appears reasonable to do this because some authors like Green and Kadhani (1985) have argued that in 1980, there was some relaxation in the economy. Moreover, foreign exchange allocation was increased and almost every sector was booming. Thus, while this study does not answer the question of whether the Z\$ is overvalued or not, it does show how its value has been moving since 1980 and before.

Figure 1 shows the trends in Zimbabwe's real exchange rate against the US dollar and the SDR from 1965 to 1985. The table shows that, up to 1970, the real exchange rate was relatively stable, but after this period it began to appreciate. In the early 1970s, there were a number of debates as to whether or not the Rhodesian dollar (R\$) was overvalued and therefore should be devalued, especially after the devaluations of the South African Rand and the US\$ (Girdlestone, 1973). Those producing exportables, like farmers and miners, favoured devaluation while the manufacturing sector was against devaluation. Girdlestone, talking for the majority of the protected manufacturing sector, argued against devaluation, as this would foster GDP disequilibrium rather than correct it. However, after this period, the real exchange rate stabilized again, up to the time of independence.

At independence, there was a slight appreciation of the real exchange rate. However, in 1982 the government devalued the Z\$ by 20%. At the same time, the exchange rate went onto a managed float, and thus over the years had depreciated substantially. It is difficult to tell whether this depreciation has been enough due to the difficulty of calculating the degree of overvaluation. Although the excess demand

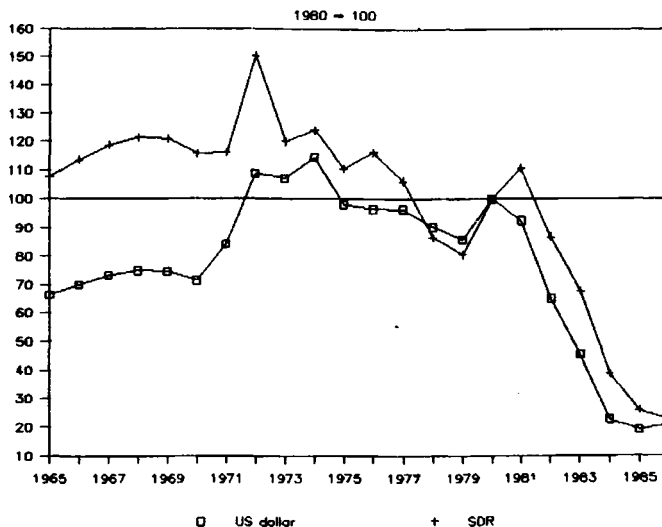


Figure 1. Zimbabwe real exchange rate, 1965 to 1986.

for foreign exchange that exists indicates that the Z\$ may still be overvalued; a sounder conclusion would be that the system of foreign exchange allocation has made it possible for Zimbabwe to support an exchange rate at which there is still excess demand for foreign currency.

Relative price trends for home goods and tradeables

Table 4 shows the trends in the relative prices in the economy. Up to about 1980, these prices have tended to remain closer to the prices of home goods. This is one of the interesting developments of the UDI period—even though the country canvassed a protection and interventionist policy environment, the authorities did not allow this to prejudice the price of tradeables. As a result, they allowed the exchange rate to depreciate and did not impose a tax on exports. After independence, the gap between the price of tradeables and certain agricultural exports, on one hand, and the price of home goods has widened. For example, in the case of the relative price of tradeables, the ratio fell from 101.9% in 1979 to 72% in 1982 and 42% in 1983. This implies that the incentives to produce for tradeables have been declining, and in the case of agriculture, growth has been lower than it should be. The gap also reflects the impact of protectionist commercial policies.

Table 4. Domestic relative prices and the real exchange rate, Zimbabwe, 1965 to 1985.

Year	Relative price of exports		Relative price of imports		Relative price of tradeables		Real exch. rate
	Index ^a	Change (%)	Index ^a	Change (%)	Index ^a	Change (%)	Index ^b
1965	1.39	0.0	0.96	0.0	1.18	0.0	0.662
1966	1.22	12.8	1.01	5.8	1.12	-5.2	0.699
1967	1.15	5.6	0.99	2.8	1.07	-4.4	0.731
1968	1.14	0.7	0.94	4.1	1.04	-2.3	0.747
1969	1.17	2.5	0.93	1.9	1.05	0.5	0.744
1970	1.25	6.7	0.93	0.4	1.09	3.6	0.843
1971	1.13	9.0	0.96	2.8	1.05	-3.5	0.843
1972	0.81	28.6	0.91	5.4	0.86	-18.0	1.089
1973	1.13	39.2	0.87	2.4	1.01	17.2	1.075
1974	1.27	12.6	1.04	15.3	1.15	14.6	1.145
1976	1.12	5.5	1.03	2.6	1.07	-1.8	0.966
1977	1.00	10.8	0.97	5.4	0.99	-8.2	0.964
1978	0.95	5.1	0.99	1.3	0.97	-1.9	0.902
1979	0.91	4.0	1.13	14.3	1.02	5.4	0.858
1980	1.00	9.7	1.00	11.3	1.00	-8.5	1.000
1981	0.88	11.8	0.79	20.6	0.84	-16.2	0.923
1982	0.88	0.1	0.70	12.2	0.73	-13.4	0.648
1983	0.88	0.4	0.70	0.5	1.72	-1.4	0.455
1984	0.85	3.9	0.70	0.0	0.77	8.1	0.228
1985	0.85	0.6	0.69	1.7	0.77	-0.4	0.209

^aData rounded to two decimal places. ^bData rounded to three decimal places.

Source: Compiled from CSO (various issues).

THE INCIDENCE OF TRADE AND EXCHANGE RATE POLICIES

In this section, the impact of trade and exchange rate policies on the level and structure of incentives in the economy is calculated. To do this, a model developed by Dornbush (1974) and Sjaastad (1980) and extensively utilized in many International Food Policy Research Institute (IFPRI) studies is also used here. This is a model of an open economy consisting of three sectors producing exportables, importables, and nontraded goods; and derives the equilibrium price relationships among the three (Dyejide, 1986; Bautista, 1987).

The model

The regression equation of the model is:

$$\log \frac{P_h}{P_x} = a + W \ln \left(\frac{P_m}{P_x} \right)$$

Where Ph = price index for nontradeables
 Px = price index for exportables
 Pm = price index for importables.

In this equation, the interpretation of W , referred to as the incidence parameter, is very important. According to Dyejide, W measures the combined effects of trade and exchange rate policies on relative price changes of the three sectors. A high W means a country's nontradeable goods and importables are close substitutes. Thus, an increase in the relative price of importables to exportables, due to trade and exchange rate policies, would lead to a composite increase in the relative price of nontradeables to exportables. As a result, production for exportables would become unattractive. Since agriculture is the major contributor to the production of exportables, it would absorb most of the burden.

Empirical results

For Zimbabwe, the regression results are shown on Tables 5 and 6. Two variables have been added to the equation since time-series data has been used in the estimation. The Cochrane-Orcutt method was used to correct for first order serial correlation. For all the equations run, the W coefficient was significant, and the R^2 was also reasonable.

Table 5. Regression results for total exports, Zimbabwe, 1965 to 1985.

Independent variables	Dependent variables			
	$\text{Log } \frac{Ph1}{Px}$	$\text{Log } \frac{Ph2}{Px}$	$\text{Log } \frac{Ph3}{Px}$	$\text{Log } \frac{Ph4}{Px}$
Constant	0.9000 (2.7168)	-2.6053 (4.1115)	1.8677 (2.4951)	1.1413 (2.4324)
$\text{Log } (Pm/Px)$	0.7980 (0.1425)	0.7857 (0.2777)	0.9952 (0.1701)	0.8667 (0.1559)
Log GDP	-0.0284 (0.3007)	0.3686 (0.5005)	-0.1920 (0.3039)	-0.1050 (0.2950)
Log BOT	-0.0121 0.1165	-0.0099 (0.0215)	0.0044 (0.0013)	-0.0011 (0.0121)
R^2	0.6560	0.3209	0.6132	0.6713
DW	1.5370	1.4530	1.4708	1.4292
P	0.9558	0.8024	0.7987	0.8250

$Ph1$ = building material price index; $Ph2$ = component of domestic workers wages in CPI; $Ph3$ = food component of CPI; $Ph4$ = average CPI. The figures in parentheses are the standard errors.

Results displayed on Table 5 show that for total exports, W is between 0.78 and 0.87. This means that for Zimbabwe, importable goods and nontradeable goods are fairly close substitutes. As a result, we expect that if the relative price of importables increases by 1%, then the relative price of importables increases by 1%, then the relative price of nontradeables to exportables would increase by between 0.78% and 0.87%. Therefore, this result partly explains Table 4 which shows that over time the relative prices of exports have declined under an import substitution industrialisation regime supported by such controls as the foreign exchange allocation system, price controls, and investment controls. A fall in the relative prices of tradeables to those of nontradeables, implies a diversion of resources to production for the home market. Therefore, Zimbabwe's trade and exchange rate policies partly explain the performance of agriculture and the consequent decline in employment levels in the sector.

Due to the difficulties of getting time-series data on the price of agricultural exports, it was impossible to calculate the impact of trade and exchange rate policies on the agricultural sectors as a whole. However, estimation on certain agricultural export--three of which are classified as food exports (maize, beef, and coffee) and two cash crops (tobacco and cotton)--was carried out. The overall import price index was used, since none of these goods are normally imported into Zimbabwe. For all the equations, the W coefficient was significant at the 5% level of confidence, and the R^2 was to be quite high (see Table 6).

Table 6. Regression results for agricultural commodities, Zimbabwe.

Independent variable	Dependent variable				
	Coffee	Beef	Maize	Cotton	Tobacco
	Log $\frac{Ph1}{Px \text{ coffee}}$	Log $\frac{Ph1}{Px \text{ Beef}}$	Log $\frac{Ph2}{Px \text{ Maize}}$	Log $\frac{Ph1}{Px \text{ Cotton}}$	Log $\frac{Ph1}{Px \text{ Tobacco}}$
Constant	-11.4340 (1.7285)	-8.8859 (1.8519)	0.4138 (3.8198)	-11.7610 (1.5177)	-8.3647 (1.9232)
Log $Pm/Px1$	0.8335 (0.1094)	0.8838 (0.0507)	0.9673 (0.0906)	0.9019 (0.1619)	0.7087 (0.1205)
Log GDP	1.5152 (0.2247)	1.1636 (0.2132)	-0.0186 (0.4631)	1.4068 (0.1855)	1.0256 (0.2395)
R^2	0.9463	0.9722	0.9366	0.9090	0.7903
DW	1.9260	1.6564	1.1702	1.7842	1.6920

$Ph1$ = building material price index; $Px1$ = the export price index of agricultural commodity 1; $Ph2$ = food component of the low income consumer price index. The figures in parenthesis are the standard errors.

For all the crops under discussion, the incidence parameter is quite high, between 0.7 and 0.9. The most surprising result is for maize, with an incidence parameter of 0.9. Strictly speaking, for Zimbabwe maize is not really a tradeable good as it is exported only after the domestic market has been satisfied. Moreover, maize has historically been given a higher domestic price compared to the export price. These results show that maize production is sensitive to policy charges. Since the majority of the peasants are involved in maize production, an exchange rate policy that impacts negatively on the incentives to produce maize would lead to a reduction in rural incomes, affecting both peasant farmers and agricultural labour. An export price for maize that is not competitive means that the earnings of the Grain Marketing Board (GMB) will be declining, leading to a deficit. To cover the deficit, government will either increase the subsidy to the GMB (which is becoming unsustainable) or reduce the producer price paid to farmers by the GMB. Both strategies have serious conclusions for food security. Increasing subsidies to the GMB will lead to an increase in the budget deficit, thus leading to inflationary tendencies. Reducing the producer price will kill the incentives for maize production. Clearly then, the GMB requires a competitive export price to remain viable.

Thus, these results explain Table 4 and Figure 1. When the Z\$ became seriously overvalued by 1981, the relative price of tradeables started to decline, but after the devaluation in December 1982, and with some lag, it began to improve.

A POLICY PACKAGE FOR ZIMBABWE?

In summary, these results show that trade and exchange rate policies have an adverse impact on the sectors producing tradeables. However, since growth appears to be foreign exchange constrained, some policy changes in favour of promoting exports need to be instituted. Policymakers need to ask a number of questions about the exchange rate, because it is a major component of the structural adjustment programme. The following questions should be asked:

- o Does Zimbabwe need to reform its exchange rate? What form should this take?
- o In a strategy to adjust the exchange rate, what accompanying reforms are necessary in the area of fiscal policy?
- o What reforms need to be made in the present system of foreign exchange allocation?
- o What policies should be introduced to protect the vulnerable groups that will suffer due to exchange rate adjustment?

In Zimbabwe, there appears to be a connection between fiscal reform, exchange rate adjustment, and the foreign exchange allocation system. However, since the exchange rate is central to structural adjustment, we will only discuss here the different options open to Zimbabwe in this area.

In Zimbabwe, the debate on exchange rate adjustment has acquired an ideological flavour, with those in favour of exchange rate adjustment seen as belonging to the right wing camp. This is regrettable, since exchange rate adjustment is an instrument designed largely to improve the competitiveness of a country. As such, it works in

the same way as a subsidy or commercial policy. The advantage of exchange rate adjustment is that it is less powerful than adjustments in other relative prices (e.g., wage adjustments).

Exchange rate adjustment would improve the competitiveness of the agricultural sector because it would force farmers to employ more of the cheaper factor of production, labour. Under the existing system, where there appears to be some currency overvaluation, labour is artificially expensive relative to say capital. However, because of foreign exchange constraints, farmers are forced to utilize the artificially expensive labour. Once the exchange rate is adjusted, labour will become relatively cheaper. as a result, agricultural exports would become more competitive and it is possible to envisage employment in the sector increasing.

In the area of exchange rate adjustment, Zimbabwe has probably two options, either to institute discrete devaluation or adopt a crawling peg. It seems unlikely that Zimbabwe could accept a floating system, even temporarily, because such a system would result in greater volatility in the economy. Moreover, a float is inimical to Zimbabwe's professed policy stance, that of control and intervention in the economy. For Zimbabwe, the crawling peg system appears attractive since it would allow for automatic exchange rate adjustments once a particular, like amount of foreign exchange reserves changes. Moreover, because adjustments are automatic, exchange rate charges need no longer directly excite political emotions.

However, it should be emphasized that exchange rate adjustment will be successful and less painful only if fiscal policy reform is already in place.

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